

Application No.: 10/069,772
Inventor: FEUSSNER et al.
Reply to Office Action of 04 May 2006
Docket No.: 50669

Amendments to the Claims:

1. (currently amended) An isolated nucleic acid sequence which encodes a polypeptide with desaturase activity, selected from the following group:
 - a) a nucleic acid sequence with the sequence shown in SEQ ID NO: 1,
 - b) nucleic acid sequence which, as a result of the degeneracy of the genetic code, are derived from the nucleic acid sequence shown in SEQ ID NO: 1,
 - c) derivatives of the nucleic acid sequence shown in SEQ ID NO: 1 which encode polypeptides with the amino acid sequence shown in SEQ ID NO: 2 and which have at least 75% 90% homology at amino acid level without reducing the enzymatic activity of the polypeptides to less than 10% of the activity of the polypeptides with the amino acid sequence shown in SEQ ID NO: 2.
2. (withdrawn) A protein encoded by a nucleic acid sequence as claimed in claim 1.
3. (withdrawn) A protein as claimed in claim 2, encoded by the sequence shown in SEQ ID NO:1.
4. (previously presented) A nucleic acid construct comprising the nucleic acid sequence as claimed in claim 1, where the nucleic acid sequence is linked to one or more regulatory sequences.
5. (previously presented) A vector comprising the nucleic acid sequence as claimed in claim 1 or a nucleic acid construct comprising said nucleic acid sequence linked to one or more regulatory sequences.
6. (previously presented) A non-human organism comprising the nucleic acid sequence as claimed in claim 1 or at least one nucleic acid construct comprising said nucleic acid linked to one or more regulatory sequences.

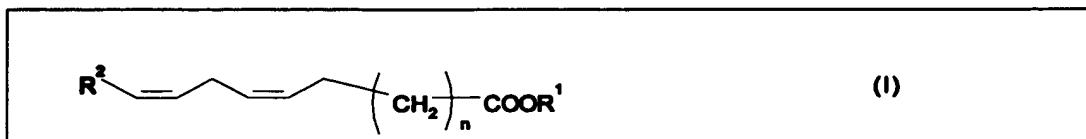
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7. (previously presented) The non-human organism as claimed in claim 6, which is a plant, a microorganism or an animal.
8. (previously presented) A transgenic plant comprising the nucleic acid sequence as claimed in claim 1, wherein said nucleic acid sequence a nucleic acid construct comprising said nucleic acid linked to one or more regulatory sequences.
9. (previously presented) A process for the preparation of saturated or unsaturated fatty acids, which comprises introducing the nucleic acid sequence as claimed in claim 1 or a nucleic acid construct comprising said nucleic acid linked to one or more regulatory sequences into an organism, growing this organism, isolating oil contained in the organism and liberating fatty acids contained in the oil.
10. (previously presented) A process for the preparation of triglycerides with an increased content of unsaturated fatty acids, which comprises introducing the nucleic acid sequence as claimed in claim 1 or a nucleic acid construct comprising said nucleic acid linked to one or more regulatory sequences into an organism, growing this organism and isolating the oil contained in the organism.
11. (canceled)
12. (previously presented) A process for the preparation of triglycerides with an increased content of saturated fatty acids, which comprises introducing the nucleic acid sequence as claimed in claim 1, wherein said nucleic acid sequence is a nucleic acid construct comprising said nucleic acid linked to one or more regulatory sequences into an organism, growing this organism and isolating oil contained in the organism.
13. (currently amended) The process as claimed in claim 9, wherein the unsaturated fatty

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acids have acid has an increased calendulic acid content.

14. (currently amended) The process as claimed in claim 9, wherein the organism is one of a plant or and a microorganism.
15. (withdrawn) An unsaturated or saturated fatty acid prepared by a process as claimed in claim 9.
16. (withdrawn) A triglyceride with an increased content of unsaturated fatty acids prepared by a process as claimed in claim 10.
17. (canceled)
18. (withdrawn) a triglyceride with an increased content of saturated fatty acids prepared by a process as claimed in claim 12.
19. (canceled)
20. (withdrawn) A method for isolating a genomic sequence comprising homology screening with the nucleic acid sequence as claimed in claim 1 or a fragment thereof.
21. (canceled)
22. (withdrawn) An enzyme which converts a fatty acid of the structure I,



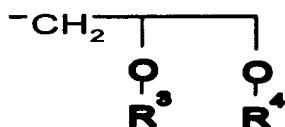
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which has two double bonds separated from each other by a methylene group, to give a triunsaturated fatty acid of the structure II,



the three double bonds of the fatty acid being conjugated and the substituents and variables in the compounds of the structures I and II having the following meanings:

R^1 = hydrogen, substituted or unsubstituted, unsaturated or saturated, branched or unbranched C₁-C₁₀-alkyl-,



R^2 = substituted or unsubstituted, unsaturated or saturated C₁-C₉-Alkyl-,

R^3 and R^4 independently of one another are hydrogen, substituted or unsubstituted, saturated or unsaturated, branched or unbranched C₁-C₂₂-alkylcarbonyl or phosphor-, n = 1 to 14.

23. (canceled)
24. (currently amended) The isolated nucleic acid sequence which encodes a polypeptide with desaturase activity of Claim 23 claim 1, wherein said derivatives of the nucleic acid sequence shown in SEQ ID NO: 1 which encode polypeptides with the amino acid sequence shown in SEQ ID NO: 2 and which have at least 80% 90% homology at amino acid level without reducing the desaturase activity of the polypeptides to less than 10% 20% of the desaturase activity of the polypeptides with the amino acid sequence shown in

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SEQ ID NO: 2.

25. (currently amended) The isolated nucleic acid sequence which encodes a polypeptide with desaturase activity of ~~Claim 23~~ claim 1, wherein said derivatives of the nucleic acid sequence shown in SEQ ID NO: 1 which encode polypeptides with the amino acid sequence shown in SEQ ID NO: 2 and which have at least 75% 90% homology at amino acid level without reducing the desaturase activity of the polypeptides to less than 20% 30% of the desaturase activity of the polypeptides with the amino acid sequence shown in SEQ ID NO: 2.
26. (currently amended) The isolated nucleic acid sequence which encodes a polypeptide with desaturase activity of ~~Claim 23~~ claim 1, wherein said derivatives of the nucleic acid sequence shown in SEQ ID NO: 1 which encode polypeptides with the amino acid sequence shown in SEQ ID NO: 2 and which have at least 80% 95% homology at amino acid level without reducing the desaturase activity of the polypeptides to less than 20% of the desaturase activity of the polypeptides with the amino acid sequence shown in SEQ ID NO: 2.
27. (currently amended) The desaturase of Claim 1 wherein said enzyme causes a regiospecific shift of a *cis* double bond in position C9 to a *trans* double bond in position C10 and introduces a **new** *trans* double bond at position C8.
28. (new) An isolated nucleic acid comprising SEQ ID NO: 1.
29. (new) An isolated nucleic acid which hybridizes with SEQ ID NO: 1 under standard hybridization conditions.
30. (new) The isolated nucleic acid of claim 28, which is at least 90% homologous with the

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complement of SEQ ID NO: 1 and has not less than 30% of the enzymatic activity of
SEQ ID NO: 2.